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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/825,342

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Nicholas K. Eib

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06/12/2006

LSI LOGIC CORPORATION

1621 BARBER LANE

MS: D-106

MILPITAS, CA 95035

EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,342

Applicant(s)

EIB ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 04/04.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-10, and 13-20, in the reply filed on May 11, 2006, is acknowledged. The traversal is on the ground(s) that the class/subclass search for Group I includes the class/subclass search of Group II, to ensure that no relevant art is overlooked, and that there is no serious burden on the examiner. This is not found persuasive because the non-elected claims (Group II) is directed to an apparatus and requires a different field of search, and because of reasons of record.

Claims 11-12, are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 1756

3. Claims 1, 3-6, 10, 13, 15-17, and 20, are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent Application Publication No. 2005/0068510 (Bleeker et al., hereinafter referred to as Bleeker).

Bleeker, in [0011], [0012], [0013], [0015], [0016], [0043], [0044], [0046], [0061], [0063], [0075], [0117], discloses a method of forming a pattern on the semiconductor wafer (device manufactured), by modulating light to a first portion of the radiation sensitive material layer on the substrate using a mirror array (individually controllable mirrors that are tilted, tilted mirrors and pistons or adjusters) incorporated with adjusters (first pattern), modulating light to another portion of the radiation sensitive layer on the substrate (shifting the substrate in the X and/or Y direction so that a different target portion of the substrate can be exposed, second feature of the pattern) using the tilted mirrors coupled with a plurality of adjusters, such as pistons (piston mirrors), such that displacement of mirrors occurs (path length adjusting), resulting in the modulation of the path length that corresponds to the varying intensities of interference during the exposures (claims 1, 6, 13, and 17). Bleeker, in [0016], [0017], [0117], [0118], and [0119], discloses that the tilted mirrors (micromirror array) are form a separate part of the mirror array from the piston mirrors, and that the tilting and displacement modes (tilting, planar movement) are performed simultaneously (claims 3-4, and 15-16). Bleeker, in [0118], discloses that the aberrations and focus deviations are reduced i.e., resolution is enhanced, due to incorporation of the plurality of adjusters (pistons) with the patterning array (mirror array) (claim 5). Bleeker, in [0106], [0120], and [0121],

discloses that the tilted mirrors (patterning array) is in a non-planar arrangement i.e., arranged in an alternating row configuration (claim 10, and 20).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 8, and 14, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication No. 2005/0068510 (Bleeker et al., hereinafter referred to as Bleeker) in view of U. S. Patent Application Publication No. 2006/0077506 (Sandstrom).

Bleeker, is discussed in paragraph no. 3.

The difference between the claims and Bleeker is that Bleeker does not disclose that the adjacent mirrors of the tilt mirrors are controlled to generate a phase difference of about 520 degrees on a predetermined portion of the radiation sensitive layer (claims 2, and 14). Bleeker does not disclose that the tilt mirrors are controlled such that the adjacent mirrors generate a phase difference that ranges from 400 to 600 degrees on a predetermined portion of the radiation sensitive layer as recited in claim 8.

Sandstrom, in [0036], discloses that that the adjacent mirrors of the tilt mirror array generate a phase difference of approximately 257 degrees (a total of about 514 degrees phase difference).

Therefore, it would be obvious to employ the tilt mirror configuration suggested by Sandstrom because Sandstrom, in [0036], and [0039], discloses that employing such a tilt mirror configuration (i.e., tilt angle formed by overtilting the mirrors) generates the claimed phase difference and favorable properties such as improved contrast at feature boundaries in both positive and negative resists.

6. Claims 7, 9, and 18-19, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication No. 2005/0068510 (Bleeker et al., hereinafter referred to as Bleeker) in view of U. S. Patent No. 5,015,080 (Cassarly et al., hereinafter referred to as Cassarly).

Bleeker is discussed in paragraph no. 3.

The difference between the claims and Bleeker is that Bleeker does not disclose that two adjacent mirrors of the piston mirrors exhibit a 180 degree phase difference (claims 7, and 18). Bleeker does not disclose that two adjacent mirrors of the piston mirrors exhibit a phase difference of about 280 degrees (claims 9, and 19).

Cassarly, in col 4, lines 1-8, in col 5, lines 24-48, in col 6, lines 20-26, and in col 11, lines 1-25, discloses piston mirror arrays that exhibit adjacent mirror phase difference that ranges from 0 to multiples of 2π degrees.

Therefore, it would be obvious to a skilled artisan to modify Bleeker by employing the piston phase shifter mirror array configuration suggested by Cassarly because Cassarly, in col 6, lines 20-37, discloses that creating the claimed phase difference between mirrors results in a continuous phase across the combined beam that enables continuous scanning over a wide angle with minimized grating lobes.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

June 6, 2006.


JOHN A. MCPHERSON
PRIMARY EXAMINER